REMARKS/ARGUMENTS

Claims 1-36 are currently pending in this application. Claims 1, 6, 12 and 19 have been amended to more particularly and distinctly claim the subject matter of the present invention. The Applicants submit that no new matter has been added by the amendment herein.

Claim Rejections - 35 USC § 102(e)

Claims 1-5, 23-28 and 32-36 have been rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application No. 2004/0204108 by Etkin et al. (hereinafter "Etkin").

With respect to claim 1, the Examiner asserts that Etkin discloses a method for coordinating the use of beam forming between two entities that do not communicate control information regarding the use of beam forming indicating that the period before the beam forming operations is understood as the same. The Applicants respectfully disagree.

In claim 1, two communicating entities do not communicate beam forming information not only during the initial stage before beam forming operation but throughout the communication process. Both entities do not know whether the other is adjusting a beam so as to address misalignment of the beams. Therefore, there is a possibility of oscillation caused by simultaneous adjustment by two

entities. In order to avoid this oscillation, only one entity is selected to adjust beam forming to realign the beams.

In contrast, in Etkin, the two communicating entities, (i.e., a base station and a mobile station), communicate with each other and the base station adjusts beam width and induced SINR fluctuations based on the reported DRC from the mobile stations. Etkin discloses as follows:

> As the base station 12 transmits signals ... each of the mobile stations 14 ... receive the signal and computes a SINR. The mobile station 14 then selects a corresponding data rate that can be supported and transmits this requested data rate information to the base station 12 over the reverse link DRC (data rate control) channel. (Emphasis added).
>
> The base station 12 is configured to identify the mobile stations 14 in the sector 10 based upon the DRCs transmitted to the base station 12 by the mobile stations 14. The base station 12 then determines the fluctuation rate and the beam width based on the number of mobile stations 14 in the sector 10 ...

(See paragraphs 0049 and 0051 of Etkin). In Etkin, the base station constantly receives DRC signals from the mobile station, and makes adjustments on beam width and fluctuations based on the reports from the mobile stations. In contrast, in claim 1, two communication entities do not communicate beam adjustment information. The selected entity adjusts its own beam without receiving any information for beam adjustment from the other entity. Therefore, it is respectfully submitted that claim 1 is clearly distinguishable from Etkin.

The Examiner also asserts that Etkin discloses measuring an error in the alignment of the beams from the two entities based on the premise that in Etkin each mobile station computes SINR and the SINR level will be higher when the beam is directed toward the mobile station and lower when the beam is directed away from the mobile station. The Applicants respectfully disagree.

Etkin is not related to the alignment of beams emanating from two communicating entities. Etkin is directed to adjustment of beam width and induced SNR fluctuations in accordance with the number of mobile stations in a sector to maximize the throughput of the base station. Etkin discloses as follows:

> the invention comprises systems and methods for controlling various parameters of an antenna array ... as a function of the number of mobile stations in a sector...
>
> The beam width ... has important effects on sector throughput. These effects depend on the number of mobile stations... there is an optimum beam width that maximizes the sector throughput.
>
> The rate of induced SINR fluctuations also has important effects on the overall base station throughput, and these effects depend on the number of mobile stations as well. ... Fast induced SINR fluctuations cause a degradation in SINR prediction in mobile stations resulting in lower data rate, ... from a prediction point of view, the induced SINR fluctuation should be as slow as possible.
>
> a method comprises identifying the number of mobile stations that are communicating with a base stations and then selecting a fluctuation rate and beam width for the antenna gain pattern ...

(See paragraphs 0020, 0023, 0024 and 0030 of Etkin). In Etkin, a base station adjusts beam width and SINR fluctuations based on the number of mobile stations. Etkin discloses that for a small number of users a broader beam is better whereas highly a directional beam is better for a large number of users. Etkin also teaches that in the case of a large number of users, a higher SINR fluctuation is better for overall base station throughput since higher fluctuation will degrade SINR estimation at the mobile stations thereby resulting in lower data rate requirements from the mobile stations and an advantage of multi-user diversity gain by the proportional fair scheduling algorithm. Paragraph 0049 of Etkin, as cited by the Examiner, is not related to a measurement of an error in alignment (i.e. a degree of misalignment) of the two beams from the two communicating entities, but rather is simply an effect of beam rotation by the base station. Etkin fails to disclose measuring an error in alignment of two beams emanating from two communication entities and readjusting the beams to realign the two beams. Therefore, claim 1 is clearly distinguishable from Etkin.

With respect to claim 23, as mentioned above with respect to claim 1, Etkin fails to disclose a process for measuring an error in the alignment of two beams emanating from two communication entities and adjusting parameters for adjusting the beams a fraction of the measured error in order to realign the two beams. Therefore, claim 23 is not anticipated by Etkin.

With respect to claim 27, Etkin similarly fails to disclose a first processor to measure an error in the alignment of two beams and a second processor for adjusting a beam by a fraction of the measured error. Therefore, claim 27 is not anticipated by Etkin.

With respect to claim 33, Etkin is directed to adjustment of beam width and induced SINR fluctuations in accordance with the number of mobile stations in a sector to maximize the throughput of the base station, not an alignment of two beams. Etkin fails to disclose adjusting parameters of a beam such that a degree of alignment between beams is above a threshold. Therefore, claim 33 is not anticipated by Etkin.

Claims 2-5, 24-26, 28, 32 and 34-36 are dependent claims of claims 1, 23, 27 and 33, respectively. Therefore, it is believed that these dependent claims are also allowable for the same reason stated above.

Claim Rejections - 35 USC § 103(a)

Claims 6-11, 19-22 and 29-31 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin in view of U.S. Patent No. 6,665,545 to Raleigh et al. (hereinafter "Raleigh"). Claims 12-18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin and Raleigh in view of U.S. Patent No.6,768,454 to Kingsley et al. (hereinafter "Kingsley").

With respect to claim 6, the Examiner asserts that Etkin discloses measuring an error in the alignment of beams and Raleigh discloses a scheme of using a correction factor for adjusting beams. However, as presented with respect to claim 1, Etkin fails to disclose measurement of the degree of misalignment of two beams, and instead merely discloses adjustment of beam width and SINR fluctuation in accordance with the number of mobile stations. Moreover, Raleigh is related to calibration of differences in the amplitude and phases in a transceiver, not adjustment of beams for realignment of misaligned beams. Etkin and Raleigh, alone or in combination, fail to disclose, teach or suggest measurement of an error in alignment of two beams and adjusting the beams in an amount equal to the measured error multiplied by each entity's correction factor. Therefore, claim 6 is allowable over Etkin in view of Raleigh.

With respect to claim 19, as presented with respect to claims 1 and 6 hereinabove, Etkin and Raleigh, alone or in combination, fail to disclose, teach or suggest measurement of an error in alignment of two beams and adjusting the beam according to each entity's correction factor and the measured error. Therefore, claim 19 is allowable over Etkin in view of Raleigh.

With respect to claim 12, claim 12 is directed to alignment of a beam both in azimuth and elevation. As presented above with respect to claims 1 and 6, Etkin, Raleigh and Kingsley, alone or in combination, fail to disclose, teach or suggest

measurement of an error in alignment of two beams and adjusting the beam according to each entity's correction factor and the measured error in an azimuth and elevation dimension. Therefore, claim 12 is allowable over Etkin in view of Raleigh and Kingsley.

With respect to claims 7-11, 13-18, 20-22 and 29-31, these claims are dependent claims of claims 6, 12, 19 and 27. Therefore, it is believed that these dependent claims are also allowable for the same reason stated above.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing remarks, Applicants respectfully submit that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Chotkowski et al.

By

John C. Donch, Jr.
Registration No. 43,593
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza, Suite 1600
30 South 17th Street
Philadelphia, PA 19103
Telephone: (215) 568-6400
Facsimile: (215) 568-6499

JCD/dmr